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HA del Portillo, C Fernandez-Becerra, S Bowman, K Oliver, M Preuss, CP Sanchez, NK Schneider, JM Villalobos, MA Rajandream, D Harris, LH Pereira da Silva, B Barrell, and M Lanzer

### A superfamily of variant genes encoded in the subtelomeric region of *Plasmodium vivax*.

► [Nature, Apr 2001; 410\(6830\): 839-42.](#)

► ... genes are present at about 600-1,000 copies per haploid genome and encode proteins that are **immunovariant** in natural infections, indicating that they may have a functional role in establishing chronic infection ...

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### Sexually Transmitted Infections



#### ORIGINAL ARTICLES:

C I Bandea, K Kubota, T M Brown, P H Kilmarx, V Bhullar, S Yanpaisarn, P Chaisilwattana, W Siriwasin, and C M Black

### Typing of *Chlamydia trachomatis* strains from urine

### samples by amplification and sequencing the major outer membrane protein gene (*omp1*)

► [Sex. Transm. Inf., Dec 2001; 77: 419 - 422.](#)

► ... , L 2 , and L 3 were initially recognised by polyclonal antibodies, and additional immunovariants (Ba, Da, Ia, etc), which in some publications are referred to as distinct serovars, have ...

► ... region of *omp1* from 18 laboratory reference strains representing all of the serovars and some **immunovariants** of *C trachomatis* was successfully amplified and sequenced using the protocol and the primers described ...

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### The EMBO Journal

A. Scherf, R. Hernandez-Rivas, P. Buffet, E. Bottius, C. Benatar, B. Pouvelle, J. Gysin, and M. Lanzer

### Antigenic variation in malaria: *in situ* switching, relaxed

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**and mutually exclusive transcripti n f var genes during intra-erythrocytic development in *Plasmodium falciparum***

► EMBO J., Sep 1998; 17: 5418 - 5426.

► ... Var genes play an important role in the pathogenicity of *P.falciparum* , encoding **immunovariant** adhesins (PfEMP1) that mediate binding of the host erythrocyte to the endothelial lining of the ...

► ... Thus, the mechanism of var gene switching in *P.falciparum* is fundamentally different from switching **immunovariant** genes in other pathogens ( Borst and Greaves, 1987 ; Deitsch et al ., 1997 ). ...

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**JAMA**



**CONTEMPO UPDATES:**

Michael P. Busch, Steven H. Kleinman, and George J. Nemo

**Current and Emerging Infectious Risks of Blood Transfusions**

► JAMA, Feb 2003; 289: 959 - 962.

► ... on mathematical models that integrate data from 4 potential sources of risk: marker-negative window-phase donations, **immunovariant** viral strains not reliably detected by current serological assays, persistent antibody-negative (immunosilent) carriers, or procedural ...

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**EUKARYOTIC CELL**



Frédéric Bringaud, Nicolas Biteau, Sara E. Melville, Stéphanie Hez, Najib M. El-Sayed, Vanessa Leech, Matthew Berriman, Neil Hall, John E. Donelson, and Théo Baltz

**A New, Expressed Multigene Family Containing a Hot Spot for Insertion of Retroelements Is Associated with Polymorphic Subtelomeric Regions of *Trypanosoma brucei***

► Eukaryot. Cell, Feb 2002; 1: 137 - 151.

► ... Interestingly, in *Plasmodium vivax* , a large cluster of 35 vir genes and pseudogenes encoding **immunovariant** surface proteins is located directly upstream of the telomere repeats ( 20 ), exactly as ...

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**REVIEW**

**Clinical Microbiology Reviews**

**REVIEWS:**

P. C. Allen and R. H. Fetterer

**Recent Advances in Biology and Immunobiology of *Eimeria* Species and in Diagnosis and Control of Infection with These Coccidian Parasites of Poultry**

► Clin. Microbiol. Rev., Jan 2002; 15: 58 - 65.

► ... **Immunovariant** strains can be isolated and substituted to provide region-specific, autogenous vaccines ( 30 ) . ...

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**The Journal of Immunology**

A Menoret, Y Patry, C Burg, and J Le Pendu

**Co-segregation of tumor immunogenicity with expression of inducible but not constitutive hsp70 in rat colon carcinomas**

► J. Immunol., Jul 1995; 155: 740 - 747.

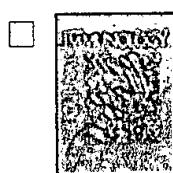
► ... An **immunovariant** of REGb, designated REGR73, was obtained passaging

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M Wallach, R Ishay-Michaeli, D Givol, and R Laskov  
**Analysis of immunoglobulin mRNA in murine myeloma cell variants defective in the synthesis of the light or heavy polypeptide chains**

► J. Immunol., Feb 1982; 128: 684 - 690.

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► ... Intracellular immunovariants. ...



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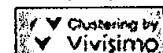
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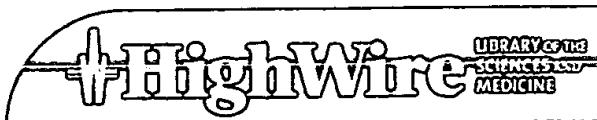


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HA del Portillo, C Fernandez-Becerra, S Bowman, K Oliver, M Preuss, CP Sanchez, NK Schneider, JM Villalobos, MA Rajandream, D Harris, LH Pereira da Silva, B Barrell, and M Lanzer

### A superfamily of variant genes encoded in the subtelomeric region of Plasmodium vivax.

► [Nature](#), April 12, 2001; 410(6830): 839-42.

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Departamento de Parasitologia, Instituto de Ci?ncias Biom?dicas, Universidade de S?o Paulo, Av. Lineu Prestes 1374, S?o Paulo, SP 05508-900, Brazil. hernando@icb.usp.br

The malarial parasite *Plasmodium vivax* causes disease in humans, including chronic infections and recurrent relapses, but the course of infection is rarely fatal, unlike that caused by *Plasmodium falciparum*. To investigate differences in pathogenicity between *P. vivax* and *P. falciparum*, we have compared the subtelomeric domains in the DNA of these parasites. In *P. falciparum*, subtelomeric domains are conserved and contain ordered arrays of members of multigene families, such as var, rif and stevor, encoding virulence determinants of cytoadhesion and antigenic variation. Here we identify, through the analysis of a continuous 155,711-base-pair sequence of a *P. vivax* chromosome end, a multigene family called vir, which is specific to *P. vivax*. The vir genes are present at about 600-1,000 copies per haploid genome and encode proteins that are immunovariant in natural infections, indicating that they may have a functional role in establishing chronic infection through antigenic variation.

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- 1. [ARS A Poultry Parasite Strain For Use in Developing Vaccines and Immunizing Chickens patent \(0\) Harry D. Danforth / Harry D. Danforth, Dec 2002](#)  
...Institute patent at-a-glance Patent Title: Production Of An **Immunovariant** Strain Of Eimeria Maxima  
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- 2. [Evolution and ecology, after the malaria genomes de Roode, J.C. / Read, A.F., Trends in Ecology and Evolution, Feb 2003](#)  
The first of the three genomes responsible for malaria was published last year; with the recent and much hyped publication of parasite and vector genomes in Nature and Science respectively, the life-cycle triad is now complete. The...  
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- 3. [Why are parasite contingency genes often associated with telomeres? Barry, J.D. / Ginger, M.L. / Burton, P. / McCulloch, R., International Journal for Parasitology, Jan 2003](#)  
Contingency genes are common in pathogenic microbes and enable, through pre-emptive mutational events, rapid, clonal switches in phenotype that are conducive to

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[<http://www.parasitology-online.com/gejng/29/42/show/P...>]  
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- 6. pbel98rept**  
May 1999  
PAGE: 5 05/07/99 ANNUAL RESEARCH PROGRESS REPORT Report of Progress (AD-421) Publications: (Continued) 08. DUBEY, J.P., THOMAZIN, K.B. and GARNER, M.M. 1998. Enteritis associated with coccidiosis in a German shepherd dog. Canine Prac. 23:5-9. 09. DUBEY, J...  
[<http://www.anri.barc.usda.gov/reports/pbel98rept.pdf>]  
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- 7. Mol Biol Evol 2001 Dec;18(12):2213-24**  
Nov 2001  
Department of Chemistry and Biochemistry, Faculty of Chemistry and Chemical Technology, University of Ljubljana, Slovenia. Department of Biochemistry and Molecular Biology, Jozef Stefan Institute, Ljubljana, Slovenia  
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- 8. Cover Story) Automating nucleic acid amplification tests (IVDT archive, Nov 00)**  
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...place while a donor is in the preseroconversion window phase, is infected with **immunovariant** viruses, or is a nonseroconverting chronic carrier. Direct, sensitive detection...  
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Silva RA1, GalvÃ£o LMC2, El-Sayed N3, Teixeira SMR1 1  
Departamento de BioquÃmica e Imunologia, ICB -UFMG;  
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 10. A superfamily of variant genes encoded in the  
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Harris / L H Pereira da Silva / B Barrell / M Lanzer,  
*Nature*, Apr 2001

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**Danforth, H.D., International Journal for Parasitology**, Jul 1998

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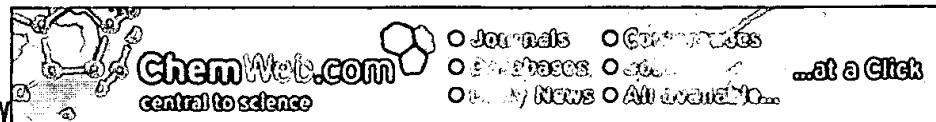
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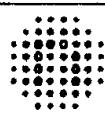
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**A Menoret, Y Patry, C Burg and J Le Pendu**

INSERM Unit 419, Biology Institute, Nantes, France.

Recent results have shown the importance of heat-shock proteins (hsp) in immune reactions. In addition, immunization against hsp purified from some immunogenic tumors specifically protects animals from a challenge with the tumor from which the hsp were purified. The protection is dependent on the association between hsp and immunogenic peptides. Using a model of rat colon carcinoma, we studied the importance of hsp70 expression in determining the tumorigenicity of cancer cells in immunocompetent syngeneic animals. Various clones with distinct tumorigenic potentials have been derived from the same parental tumor. Some clones are tumorigenic and others are rejected through an immune-based mechanism. It was observed that among all parameters tested, immunogenicity of tumors co-segregated with expression of inducible hsp70 but not with constitutive hsc70. Variants were obtained from a highly tumorigenic clone (PROb) and from a regressive clone (REGb). The PROb variant (Ph8), selected by repeated sublethal heat shocks, showed an increased capacity for hsp70 synthesis concomitant with a decreased tumorigenicity. Inversely, the REGb variant (REGR73), selected after *in vivo* growth in partially immunosuppressed rats, acquired tumorigenicity and lost the ability to synthesize hsp70. Expression of other immunologic mediators such as intercellular adhesion molecule-1, MHC I, and MHC II did not co-segregate with tumor immunogenicity. Depletion experiments showed that the immunity elicited by these tumors involves TCR-alpha beta-bearing T cells. Such observations imply that, in this experimental model, inducible but not constitutive hsp70 is involved in immunogenicity of tumors.

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